

STATE OF COLORADO

COLORADO DEPARTMENT OF HEALTH

Dedicated to protecting and improving the health and environment of the people of Colorado

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October 21, 1993

Mr. Martin Hestmark
U. S. Environmental Protection Agency, Region VIII
ATTN: Rocky Flats Project Manager, 8HWM-RI
999 18th Street, Suite 500, 8WM-C
Denver, Colorado 80202-2405

RE: COMMENTS; Technical Memorandum No. 2 Exposure Scenarios (June 1993), to Phase I RFI/RI Workplan for Walnut Creek Priority Drainage, OU-6, Sept. 1992.

Dear Mr. Hestmark,

The Colorado Department of Health, Hazardous Materials and Waste Management Division (the Division) is transmitting comments on EPA's proposed Human Health Risk Assessment Template as they relate to the subject document.

On August 13, 1993, the Division transmitted its comments on the TM-2 Exposure Scenarios to EPA. Copies of this correspondence were forwarded to DOE and EG&G to allow work to begin on revising the subject document pending the receipt of EPA comments. Our letter acknowledged that the Human Health Risk Assessment Template had not been finalized and, as a result, additional changes might result. Consequently, the issue was raised by DOE and EG&G on whether work to revise the document should proceed

Through EPA and Division staff level discussions it was determined that work should proceed on the exposure scenarios. Pertinent to our position that work proceed is a letter dated August 12, 1993 which specifies that work on the identification of exposure scenarios should not be subject to a "work stoppage". Transmittal of comments on the Template, as they relate to exposure scenarios, serve to support this decision DOE, through these additional comments, should now be able to address the Division's issues on exposure scenarios to the fullest extent possible. This will, however, require that DOE translate the section specific comments on the Template into the appropriate sections and tables of TM-2. Please communicate this need to DOE when forwarding our comments.

We assume that EPA will finalize the Template in the near future and that it will reflect the Division's positions on appropriate exposure scenarios. However, it is clear that TM-2 must be finalized as a stand alone document unsupported directly by the Template

If you have any questions concerning the issue or the comments, please call Harlen Ainscough of my staff at 692-3337

Sincerely,

Gary W. Baughman, Chief
Facilities Section
Hazardous Waste Control Program

Attachment

cc Daniel S. Miller, AGO
Jackie Berardini, CDH-OE
Bill Fraser, EPA

DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE

A 0006 000072

Colorado Department of Health
Hazardous Materials & Waste Management Division

Comments

ON

EPA's PROPOSED

HUMAN HEALTH RISK ASSESSMENT TEMPLATE

AS APPLICABLE

TO

TECHNICAL MEMORANDUM NO. 2

JUNE, 1993

TO THE

FINAL PHASE I RFI/RI WORK PLAN

FOR

WALNUT CREEK PRIORITY DRAINAGE

OU-6

ROCKY FLATS PLANT

SEPTEMBER, 1992

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Section 3.0: Instead of "(soil, water, air)", be more specific as on page 2-1, i.e., "(surface soil, subsurface soil, surface water, ground water, air)".

Regarding language on Page 3-1, institutional controls are only one option when highly unacceptable risks are found using the future on-site residential land use scenario.

It is not clear either here or later in the text or in the exposure parameter tables which exposure scenarios EPA suggests will be used for evaluating "unlikely" scenarios at the "screening level". This needs to be specifically delineated.

The third paragraph on this page should be redone. The second sentence of this paragraph should be changed to read, "If this exposure scenario is determined to be unlikely, the level of effort

devoted to evaluating this scenario will be at the screening level, using standard **direct** exposure assumptions and no fate and transport modeling." The last sentence should be deleted

Section 3.2.3: On page 3-3, upslope winds are often quite strong, and should at least be mentioned here

Section 3.2.4: The recent report by Ebasco which considerably revised and updated interpretations of the stratigraphy at Rocky Flats should be included here since this new information could alter estimations of whether ground water can travel offsite or not, and if so, how fast the water could travel. The report is summarized in an Addendum to Appendix C of the Health Advisory Panel, Rocky Flats Health Studies Briefing Book 12, May, 1993.

Section 3.3.1: Regarding language on pages 3-8 and 3-9, the statement that "Within a 6.4-mile radius of the center of RFP, there is little residential or commercial development" does not take the housing development north of Standley Lake into account. This development is about three-to-four miles from the center of the plant.

Moreover, the land directly west of RFP is not government owned. It is privately owned until well into the mountains, where the national forest boundary is located.

Section 3.3.2.1: To state that the northeastern portions of Jefferson County, including RFP is one of the most concentrated areas of industrial development in the Denver metro area is inaccurate. Look at Commerce City, the South Platte River corridor, and north Denver to name a few.

Section 3.3.2.2: The Division thinks that there are many errors and assumptions in this portion of the text. These should be revised or removed.

The section on W-470 at least should be revised to show the uncertainty of any plans regarding this highway as follows: "and (3) the possible alignment of W-470," and "If completed, W-470 is expected to have significant impacts on growth in the area". However, as the Division currently understands it, W-470 is a dead issue, and any references to it should really be stricken from the text.

The Division does not agree with the statement that residential development is less likely than industrial development in the areas near Rocky Flats. The presence of open space has been shown to be attractive to adjacent residential development along the Front Range time and time again. No matter who did the study cited in the first paragraph on page 3-10 or what Jefferson County's plans and expectations are, the facts are that residential development in the north Jeffco area is progressing much faster than industrial

growth According to Jean Jakobus of the Jefferson County Policy Development Unit, one must look at the whole picture in northeast Jefferson county The unincorporated areas are being developed very rapidly for residential use, but as soon as a certain population is reached, the areas are incorporated into the cities of Arvada and Westminster This incorporation results in an apparent preponderance of industrial growth in unincorporated Jefferson county because the cities, not the county keep track of the population growth in their newly incorporated areas She also believes that while birth rather than in-migration may have predominated in 1989, the in-migration rate in the whole metropolitan area has drastically changed since then, and Denver is booming compared to most other areas in the country. Therefore, the Division feels that we should not over-rely on documents that are outdated and which may not accurately project population or growth in the RFP area to make our conclusions regarding future land use. The Division believes we should leave our options as open as possible regarding the possibility of large amounts of residential development in the RFP area.

Regarding text on page 3-11, revise the following sentence by inserting the words, " and residential" at the end. "Directly to the east, the zoning and usage are expected to remain open-space, agricultural/vacant and residential".

The last paragraph (page 3-11) needs attention. The "above information" does not indicate that current land use in the immediate vicinity of RFP is primarily commercial/industrial. Much of the area may be zoned that way. However, current use now is low density agricultural, residential, and open space. This observation can be borne out by simply taking a drive through the area around RFP. Competition for remaining available land will be a first come-first serve proposition, and right now, residential development appears to be far ahead of any other use.

Section 3.3.3.2: Please see our comments to TM5 for OU2.

Regarding text on page 3-12, alternative 3 has apparently been chosen. This section should be updated to show this change

According to the Statement of Purpose for the Rocky Flats Local Impacts Initiative, relocating private industry into Rocky Flats buildings is not one of the group's objectives. It is just one of the possibilities that may occur at RFP.

On page 3-13, the availability of water will not preclude development of any area anywhere. Look at Phoenix, Arizona! If people decide to live or work in an area, regardless of the decision wisdom, a water supply will be found. This has been true historically, and will probably remain true. People will always win out in the end. The same is true for protecting the ecological resources of the area When enough people live in the Denver area,

and remaining real estate has become sufficiently valuable, it will be developed, regardless of the ecosystem

Bottom line: The arguments presented do not sufficiently make the case for "unlikely" future residential development

Section 3.3.4: The Division does not agree that future residential uses on-site are unlikely, especially in the buffer-zone OUs. Residential development often finds open space attractive; there are numerous examples of this all along the Front Range. Limited water resources for residential development has not stopped the residential development of Thornton, or Westminster, or any other suburb of Denver. The presence of airports and industrial/commercial areas also has not stopped residential development in a number of Denver areas.

It is not clear from the text why the agricultural scenario is not being considered for evaluation since current agricultural use does occur, and future agricultural use is identified as "conceivable". Off-site farmers conceivably could bound off-site residential exposures. Moreover, the ingestion of homegrown meat and of homegrown produce is included in the tables of exposure parameters under the Residential Scenario (Tables 3-7, 3-8, and 3-15). The rationale for this combination of residential and agricultural scenarios needs to be made more clear.

Section 3.3.5.1: In conversations with Bonnie Lavalley (7-8-93), she stated that the future residential scenario would not include an RME estimate, but would be done at a screening level, and would only include direct exposures. This is not at all clear from the text in this section. The top sentence of p. 3-17 states that "This scenario" (meaning residential) "will evaluate the reasonable maximum risk to the residents both now and in the future". We are confused as to what this means, if not an RME. If there is a difference in the way off-site and on-site residents will be evaluated, that difference must be clearly explained somewhere in the text. It is particularly confusing because the tables of exposure factors recommend a very broad range of pathways for the residential scenario without any kind of delineation of which pathways will be used for the screening level assessment of future on-site residents and which parameters will be used for other residential scenarios. In addition, the Division feels that a screening level, direct exposure assessment for on-site residents will be adequate, if all direct exposure pathways are included. The direct exposure pathways which the Division thinks must be included are: soil ingestion, soil dermal contact, inhalation of indoor VOCs, inhalation of indoor and outdoor dust, and ingestion of homegrown produce.

Section 3.4.4.1: Ingestion of fish caught from Woman and Walnut creeks is considered to be incomplete because of the relative lack of fish in these intermittent creeks. However, it should be made

clear that the ingestion of fish from Standley Lake is still a complete pathway, and that often bottom feeders such as catfish are taken from this lake, even though it is stocked with trout.

Even though plant growth over the creeks does not allow ready access by livestock, these creeks and the water in Mower Reservoir are used to irrigate pastures. Therefore, direct ingestion of surface water by livestock may not be a significant pathway, but the plant uptake of chemicals possibly contained in the water could be.

Please clarify whether or not construction workers' inhalation of freshly exposed VOCs from subsoil during digging is considered a complete pathway. From the text here it would seem that this pathway is not to be assessed, yet it is included as one of the recommended exposure pathways for construction workers.

The Division still believes that exposure of young children or other possible sensitive subpopulations should be assessed as part of a baseline risk assessment. We believe that this should be done on a chemical-specific basis, only for those chemicals that occur in high concentrations, such as at hot spots, or for those that conceivably could have toxic effects on children which may differ qualitatively or in degree from the effects on adults.

Table 3-6: What is the reference for the average value of 7 years for an adult exposure duration? EPA's Exposure Factors Handbook p.5-34 states 9 years is an average value. Moreover, other tables i.e., Table 3-9 do not agree with this value. Is it a typo?

Table 3-9: What is the source for the absorption factor for organic compounds and polycyclic aromatic hydrocarbons (PAHs)? Also, some mention should be made that transdermal absorption of metals from a soil matrix depends in part on factors such as the organic content of the soil, and that values obtained at Leadville will not necessarily apply to the RFP. Site-specific values for organic content of the soil, soil type, etc. should be compared to those at Leadville if the Leadville values are to be used.

Table 3-10: Why is the inhalation rate, $1.25 \text{ m}^3/\text{hour}$ being recommended? The Exposure Factors Handbook recommends $20 \text{ m}^3/\text{day}$ ($0.83 \text{ m}^3/\text{hour}$) as a reasonable upper bound for sedentary people who stay home most of the time. Attachment A of OSWER Directive 9285.6-03, Standard Default Exposure Factors, which supercedes earlier documents states that "It was concluded that $30 \text{ m}^3/\text{day}$ " ($1.25 \text{ m}^3/\text{day}$) "may in fact be too conservative, and that $20 \text{ m}^3/\text{day}$ would be more representative of a reasonably conservative inhalation rate for total (i.e., indoor plus outdoor) exposures at home and in the workplace". $20 \text{ m}^3/\text{day}$ is often used as an RME value, even though it was computed by coupling "worst case" activity patterns with "average" adult inhalation rates (OSWER Directive 9284.6-03). Some justification should be stated here.

Table 3-11: How was the RME value of 21 events/year calculated, or what is the source for this value?

Table 3-12: The inclusion of the pathway, inhalation of vapors outside the residence, does not agree with the text. The text (p. 3-21) states that this is an incomplete pathway because volatile chemicals in surface soils have already volatilized and because dilution of vapors is expected to occur. The State still feels that construction workers digging in subsurface soil could be exposed to freshly exposed vapors by this pathway, and that it should be included. Nevertheless, the text and the table should be made consistent. Also, what is the source of the RME and AVG exposure times. A similar comment to that on Table 3-10 applies to the inhalation rate listed in this table.

Table 3-13: Regarding inhalation of vapors inside the residence, what is the source of the exposure times listed for both the RME and the AVG scenario? In addition, a similar comment to that on Table 3-10 applies to the inhalation rate listed in this table.

Table 3-15: Regarding ingestion of homegrown meat products, some explanation of why this pathway is included in the residential scenario needs to be included, if only to say that the agricultural and residential scenarios are being combined. Because there are a few herds close to RFP, and it is possible that at least some of the area herdowners consume a substantial portion of homegrown meat, the Division thinks that this pathway should be retained in the template (or exposure scenarios) regardless of whether or not separate agricultural and residential scenarios are assessed.

Table 3-17: Regarding dermal contact with ground water contaminants, what is the source for the average exposure frequency?

Table 3-18 and Table 3-32: Regarding ingestion of locally caught fish, a statement needs to be made that this exposure pathway is to be used to cover ingestion of fish caught in reservoirs like Standley Lake since the text explicitly states that ingestion of fish caught in the creeks is an incomplete pathway. Also what is the source of the ingestion rate and the exposure frequency? These values do not agree with the Standard Default Exposure Factors OSWER Directive, which recommends a value of 54 g/day of recreationally caught fish, at 2 meals/day. This source states that values in the Exposure Factors Handbook, "are from limited studies of fishermen on the west coast and may not be applicable to catches in other areas".

Table 3-19 and Table 3-22: Regarding construction worker inhalation of particulates and inhalation of vapors, what is the source of the inhalation rate? Is it a value of $1.67 \text{ m}^3/\text{hr} \times 8 \text{ hr} = 13.36 \text{ m}^3/\text{workday}$. The Exposure Factors Handbook recommends a value of $20 \text{ m}^3/8 \text{ hr workday}$. We could not find the 30 days/year exposure

frequency listed in the EPA, 1991b reference, "Standard Default Exposure Factors". Please check this reference.

In addition, some clarification needs to be made in the text that construction workers' inhalation of vapors from subsurface soil is considered to be a complete pathway, since the text on p. 3-21 considers outdoor inhalation of vapors from volatile chemicals to be an incomplete pathway.

Table 3-20: Regarding construction worker dermal contact with surface soil, some justification for recommending the default 5300 cm²/event surface area value should be given. Often jobs require workers to wear long sleeves and pants, which would mean only the head, hands and forearms would be exposed. If this were the case, a surface area of 2000 cm² is recommended by the Dermal Exposure Assessment Interim Report. Again, we could not find the 30 events/year exposure frequency value in the reference given. Finally, the reference given for footnote 2 (EPA, 1989b) differs from that given for the same footnote in Table 3-9.

Table 3-21: Again regarding construction worker soil ingestion, we could not find the 30 days/year value for exposure frequency. Please clarify.

Table 3-23: Regarding office worker inhalation of particulates, some statement needs to be made that indoor dust is considered to be substantially the same as outdoor dust.

Table 3-24: Regarding office worker dermal contact with surface soil, the reference given for footnote 2 differs from that given for the same footnote in Table 3-9. Which is correct? What is footnote 4?

Table 3-26: Regarding office worker inhalation of vapors, the exposure frequency should be changed to 250 days/year. There's a typo.

Table 3-27: Regarding recreational exposure, soil ingestion, we could not find the recommended 100 days/year exposure frequency in the reference given. Please clarify.

Table 3-28: Regarding recreational exposure, dermal contact with surface soil, the RME surface area equivalent to face, forearms, and hands, or 15% of total body surface is 2910 cm², not the default reasonable worst case value of 5300 cm² that is recommended. The 5300 cm² value is 25% of the average body surface area. Why does the adherence factor recommended for the recreational exposure scenario differ from that recommended for the construction worker. Some justification needs to be made, even if it seems obvious.

We could not find the recommended 100 days/year exposure frequency

in the reference given Please clarify.

Table 3-29: Regarding recreational exposure, inhalation of particulates and **Table 3-31:** recreational exposure, inhalation of vapors, some justification needs to be given for the recommended RME inhalation rate of 1.25 m³/hr.

What is the source for the recommended RME and AVG exposure times?

We could not find the recommended 100 days/year exposure frequency in the reference given. Please clarify.

Also, the text states that outdoor inhalation of vapors from volatile chemicals is considered to be an incomplete pathway (p.3-21), yet it is included here as a recommended pathway. This discrepancy needs to be addressed.

Table 3-30: Regarding recreational exposure, dermal contact with surface water and sediments, since the water in the creeks is usually not deep enough to swim in, a statement that the large values for surface area are meant to be used for swimming situations such as occurs in the reservoirs should be inserted in the text.

Table 3-33: Regarding ecological researcher, dermal contact with surface water and sediments and **Table 3-34** ecological researcher, dermal contact with surface soil, please explain the derivation and source of the recommended surface area values for both the RME and the AVG. Also, explain the derivation and source of the AVG exposure frequency and exposure duration values. The reference given only recommends RME values, and the fact that an AVG means the 50th percentile should at least be mentioned somewhere in the template (or exposure scenarios). The latter comment also applies to Tables 3-35, 3-36, 3-37 and 3-38.

Table 3-36: Regarding ecological researcher, inhalation of particulates, some justification for the recommended RME value needs to be made since the Standard Default Exposure Factors OSWER Directive states that, "20 m³/8 hour workday represents a reasonable upper-bound inhalation rate for the occupational setting".